



Minutes
Town of Lake Park, Florida
Regular Commission Meeting
November 4, 2009 7:30 p.m.

Town Commission Chambers, 535 Park Avenue

The Town Commission met for the purpose of a Regular Commission Meeting on Wednesday, November 4, 2009 at 7:30 p.m. Present were Mayor DuBois, Vice-Mayor Carey, Commissioners Daly, Rumsey, and Osterman, Attorney Thomas Baird, Town Manager Maria Davis and Town Clerk Vivian Lemley.

Mayor DuBois led the invocation and the Pledge of Allegiance.
Town Clerk Vivian Lemley performed the Roll Call.

ADDITIONS/DELETIONS/APPROVAL OF AGENDA

Proclamation to Eddie Cowart was deferred to the next Commission Meeting.

Motion: A motion was made by Commissioner Osterman to approve the Agenda as modified; Vice-Mayor Carey made the second.

Vote on Motion:

Commission Member	Aye	Nay	Other
Commissioner Rumsey	X		
Commissioner Daly	X		
Commissioner Osterman	X		
Vice-Mayor Carey	X		
Mayor DuBois	X		

Motion passed 5-0.

PRESENTATION

Street Lighting Options by Techno Engineering, Inc.

CRA Project Manager Richard Pittman gave a brief explanation of the purpose for the presentation and his affiliation with Techno Engineering, Inc. He introduced "Nazie" as the owner of Techno Engineering, Inc. and as the person who would be giving the presentation.

Town Manager Maria Davis stated that the purpose of the presentation was the Commission's desire to increase lighting in the Town and to explore all of the different options for lighting.

"Nazie" gave a brief history of her background and experience with street lighting. She began a Power Point presentation regarding street lighting and the option of LED lights (see Exhibit "A"). She explained the regular light poles with incandescent lights versus the LED lights (see page 3 of Exhibit "A"). She discussed why LED lights were better than the incandescent lights (see page 3 of Exhibit "A"). LED lights can last 12 to 15 years which outlasts all other types of light bulbs. She described the different types of light bulbs (see pages 5 through 10 of Exhibit "A"). She began to discuss the difference between LED lighting and other light options (see pages 14 through 16 of Exhibit "A"). She discussed how other states and cities switched to LED street lighting and how it benefited them (see pages 17 through 21 of Exhibit "A"). She discussed and explained the LED light's lifespan (see page 26 of Exhibit "A"). She discussed LED light loss factors, warranty, glare concerns, design and the recyclable value of LED lights (see pages 27 through 32 of Exhibit "A"). She continued to discuss the benefits of LED lights (see pages 33 through 46 of Exhibit "A"). She explained and discussed induction lighting and the "Icetron Quictronic System" (see pages 47 through 63 of Exhibit "A"). She discussed and explained "Comparison Tables" of LED and Induction lighting (see pages 64 through 66 of Exhibit "A"). She explained different financing options and cost estimates (see pages 67 through 74 of Exhibit "A").

Mayor DuBois asked if a Town owned lighting system would require training for employees.

Town Manager Maria Davis stated that eventually training would be needed. The fixtures are very low maintenance which would require minimal effort from employees to maintain.

Mayor DuBois asked if the Town would be responsible for getting the lighting repaired in the event of a storm or other event that would break the lighting pole.

Town Manager Maria Davis stated that the Town would be responsible for the repair and maintenance of the poles.

Commissioner Osterman asked if there were currently any companies that do maintenance on LED lighting.

"Nazie" explained that the City of West Palm Beach was using a company called C.R. Dun for the lighting maintenance.

Commissioner Osterman asked if there stimulus funds available for green conversion.

"Nazie" stated that she had not checked into it but the site to research would be EAApak? and DOA.

Commissioner Rumsey asked if the Town owned its own system but receiving the feed from FPL he would want to make sure that FPL would not skip over repairing or restoring the feed to the Town in the event of a hurricane.

“Nazie” explained that she recommended underground lighting which would have less complications.

Commissioner Rumsey asked how far into the block would the LED lights project.

“Nazie” explained that there would be a staggered design throughout the street and would be approximately five poles per block.

Commissioner Rumsey asked how much the Town was presently spending on FPL lighting.

Finance Director Anne Costello stated that the Town’s current street lighting budget was \$70,000 per year.

Commissioner Rumsey asked if the cost would decrease if LED lighting was used.

Finance Director Anne Costello explained that the entire Town was not currently lit by lampposts but would be increasing the energy usage therefore creating an increase in the electric bill.

CRA Project Manager Richard Pittman explained that the estimate of \$2,200,000.00 was based on approximately 360 new poles throughout the Town spaced on residential streets every 160 feet staggered to give 300 feet of spacing on each side. The Town would pay for energy costs only. With the current FPL system, the Town pays an energy usage, maintenance on the pole and there would be a fuel adjustment dependent upon what FPL pays for their fuel. He stated that he did not have all of the figures yet on what the Town would save by converting to LED.

Commissioner Rumsey asked that it would be an estimate of approximately \$450 per pole per year.

Finance Director Anne Costello explained that the figures she came up with were \$7 per month per pole for approximately 360 poles which was roughly \$35,000 per year in energy costs.

Commissioner Osterman asked if there were any companies that insure the street lighting in the event of a hurricane.

Town Manager Maria Davis stated that the Town’s insurance company would insure the lighting poles and they would be considered Town assets.

Commissioner Rumsey asked what municipalities currently use LED lighting.

“Nazie” stated that LED lighting has been implemented in the City of West Palm Beach.

Commissioner Osterman stated that she was very encouraged by the cost estimates and prices of the LED lights. She asked if the LED lights suffer from the high heat that they emit.

“Nazie” explained that the newer LED lights have come a long way and do not suffer from the heat as much as they used to.

Vice-Mayor Carey asked if the LED lighting system would take two years to be installed.

Town Manger Maria Davis stated that it would take approximately two years to install the LED lights.

“Nazie” stated that she had a supplier of LED lights who offered to let the Town have a block worth of LED lights to try and test out before deciding on what types of lights and wattage to use.

Vice-Mayor Daly asked if the block could by installed and lit by March.

“Nazie” explained that it was possible to have it done by March. She stated that it took approximately six weeks to receive the fixtures.

Town Manager Maria Davis recommended having a short term lease with FPL for the 200 block of Bayberry Drive and having the 300 block of Bayberry Drive installed with the LED lighting to have a side by side comparison.

Discussion ensued between the Commissioners regarding the LED lighting.

Town Manager Maria Davis asked how soon the lights and lighting fixtures could be obtained.

Commissioner Daly asked how long it would take to get the lighting installed on the test street.

“Nazie” explained that the lighting could be done in phases and the entire installation would take approximately six weeks if all of the material was in place.

Public Comment Open.

None

Public Comment Closed.

Motion: A motion was made by Commissioner Rumsey to authorize “Nazie” to explore the opportunities with the manufacturer to put in a block of street lighting as a test and then discuss the FPL option later in the meeting and to have Town staff draft language for a referendum question; Commissioner Osterman made the second.

Vote on Motion:

Commission Member	Aye	Nay	Other
Commissioner Rumsey	X		
Commissioner			

Daly	X		
Commissioner Osterman	X		
Vice-Mayor Carey	X		
Mayor DuBois	X		

Motion passed 5-0.

BOARD APPOINTMENT

Robert Dow – Library Board

Mr. Dow introduced himself and read an excerpt from “The Hobbits”. He gave a brief explanation of his background and credentials.

Mr. Robert Dow was appointed as an alternate member of the Library Board.

PUBLIC and OTHER COMMENT

Steve Hockman, 639 Flagler Dr. - stated that he was disappointed that he has not heard any comments or answers to his complaints and the complaints of residents regarding the parking meter issue. He stated that “Nazie” did a great job with her presentation. He stated that the Town should stay with the FPL lighting system. He stated that the LED lighting system was more expensive to install initially and that he felt that the Town could not afford to install them right now. He expressed his concerns regarding the installation of LED lighting in the Town.

Genanne Doughty, 1008 7th St. – read a prepared statement regarding the “Friends of the Library”. She gave a history of the hiring and accomplishments of Grants Writer Virginia Martin. She gave a list of activities and discussions that have taken place at the Library. She stated that there were many grants that the Town was eligible to tap into in order to provide services to the Town through the Library.

CONSENT AGENDA:

1. Special Call Commission Meeting Minutes of October 7, 2009
2. Resolution No. 53-11-09 Auction of Surplus Equipment
3. Resolution No. 54-11-09 Disadvantage Business Enterprise (DBE)/Minority Business Enterprise (MBE) Policy Statement for the Local Agency Plan Certification by the Florida Department of Transportation

Public Comment Open.

None

Public Comment Closed.

Motion: A motion was made by Commissioner Rumsey to approve the Consent Agenda;

Commissioner Daly made the second.

Vote on Motion:

Commission Member	Aye	Nay	Other
Commissioner Rumsey	X		
Commissioner Daly	X		
Commissioner Osterman	X		
Vice-Mayor Carey	X		
Mayor DuBois	X		

Motion passed 5-0.

DISCUSSION & POSSIBLE ACTION

Florida Power & Light Street Lighting Agreement to Install and Maintain Four Street Lights on Bayberry Drive

Commissioner Rumsey stated that staff needed to determine whether or not FPL would agree to a short term lease for the street lighting on the 200 block of Bayberry Drive.

Town Manager Maria Davis stated that if FPL did not agree to a short term lease on the lighting she would need direction from the Commission on what to do.

Commissioner Rumsey stated that if FPL did not agree then they could look at the possibility of doing a comparison of the LED lighting with the 400 block of Bayberry or place the LED lighting on the 200 block of Bayberry instead of the 300 block to do the comparison.

Mayor DuBois agreed with Commissioner Rumsey's recommendation. She stated that they needed to wait to see what FPL would agree to and take it from there.

COMMENTS BY COMMISSION, TOWN MANAGER, TOWN ATTORNEY

Commissioner Rumsey thanked the Kiwanis Club for putting on the Halloween Event at the Marina the Friday before Halloween. He stated that he had heard from a number of residents that there was a problem with the sound on Channel 18 during meetings. He asked that staff investigate the problem.

Vice- Mayor Carey thanked the Kiwanis Club for the Halloween Event. He stated that residents have complained that there have been no events but when an event takes place, residents do not

show up. He recommended that advertising for events be improved. He recommended moving up the start time of Commission Meetings to 6:30 p.m.

Mayor DuBois stated that she was flexible with her time and she agreed that it was hard to begin meetings at 7:30 p.m.

Commissioner Rumsey stated that he would like to start the meetings earlier.

Commissioner Daly agreed that the meetings could start earlier.

Commissioner Osterman expressed her concerns with moving the meetings up to a time slot that would be too early for future Commissioners that may work and not be able to make it to the meetings at an earlier time.

Vice-Mayor Carey stated that the Commission has had a lot of Attorney-Client Sessions that begin at 6 p.m. and the Commission has made it a point to be there at that time.

Commissioner Osterman stated that the public was not a part of the Attorney-Client Sessions and she was concerned that residents would not be home in time to see the meetings on TV. She stated that the meetings should start no earlier than 6:30 p.m. but she would be more comfortable with them starting at 7 p.m.

Vice-Mayor Carey stated that any time would be better than 7:30 p.m.

Mayor DuBois asked Commissioner Rumsey what time he would be most comfortable with.

Commissioner Rumsey stated that 7 p.m. would be best as a compromise.

Mayor DuBois asked how the Commission should proceed with changing the time of the Commission Meetings.

Town Manager Davis stated that an Ordinance should be created with the flexibility of changing the time if needed in the future.

Town Attorney Thomas Baird stated that the Town code would have to be amended to reflect a uniform start time for the meetings so that the public knows when the meetings would take place.

Mayor DuBois directed Town Attorney Baird to draft an Ordinance to change the start time of the Regular Commission Meetings to 7 p.m.

Commissioner Daly recommended keeping the parking meter revenue in a separate account.

Town Manager Davis stated that the revenue from the parking meters was already being kept in a separate account. She stated that she asked Finance Director Anne Costello to set up separate line items for revenue and also for expenses.

Commissioner Osterman stated that last year National City Bank had sponsored the Martin Luther King Day Event and during that time last year National City Bank had announced that it was in the process of changing its name to PNC Bank and because of that there will be no funding for the 2010 Martin Luther King Event. She asked if anyone knew of sponsorship for the event to let her know but so far has been unsuccessful in obtaining sponsorship. She stated that Grants Writer Virginia Martin has secured a grant in the amount of \$7500 for the Town's Community Garden. She stated that anyone who was interested in the Community Garden to keep their eyes open for the Town's advertisements on Channel 18 and the Town newsletter.

Commissioner Rumsey asked what the amount of money was that was needed for the Martin Luther King Day of Dreams Event.

Commissioner Osterman stated that approximately \$5000 was the cost of the event last year but had asked for \$10,000 in order to expand the event next year.

Town Manager Maria Davis stated that the event cost approximately \$6500.

Mayor DuBois also thanked the Kiwanis Club for the Halloween Event. She stated that Mr. Hockman's request regarding parking meters had been provided to him by e-mail. She asked Genanne Doughty to come back and finish the second part of her presentation. She thanked Grants Writer Virginia Martin for all her hard work and effort.

Town Attorney Thomas Baird announced that a Reasonable Accommodation Hearing was conducted yesterday November 3, 2009 on the property located at 118 Jasmine Dr. The hearing lasted approximately 3 hours and the Special Magistrate indicated that she would accept proposed orders and render a decision on or before December 25, 2009. There was a lot of information provided and one of the things that came out of the meeting was that Ms. Aberns indicated that in addition to the current sober house on 303 Foresteria and the proposed property at 118 Jasmine Dr. she has two other properties which she is leasing and plans to submit applications on within the next week. He explained that the Town was aware of other properties that may be operating in a similar fashion and without a Reasonable Accommodation and the Town would be investigating those properties and their violations.

He stated that he made an observation with regards to Mr. Dow's remarks. He stated that another thing that Hobbits were very talented at was gardening and that if Mr. Dow were to know any Hobbits to please direct them to the Town's new Community Garden.

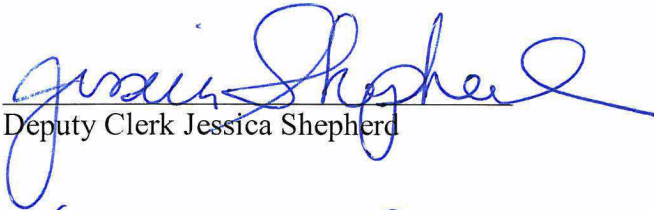
Town Manager Maria Davis congratulated Recreation Director Greg Dowling for a very successful Government Week Event. She thanked staff for taking the time to educate the students who attended the event.

ADJOURNMENT

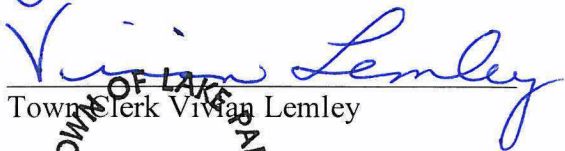
There being no further business to come before the Commission and after a motion to adjourn by Commissioner Daly and seconded by Vice-Mayor Carey, and by unanimous vote, the meeting adjourned at 9:15 p.m.



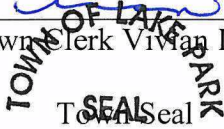
Mayor DuBois



Deputy Clerk Jessica Shepherd



Town Clerk Vivian Lemley



Approved on this 16 of Dec., 2009.

ROADWAY LIGHTING

Lighting Options For Town of Lake Park



By: Mehnaz D'jahanshahi, P.E.

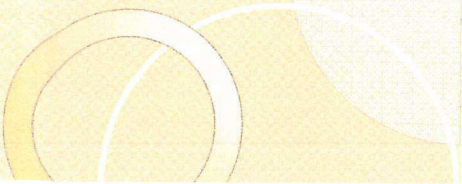
Topics

- **Introduction**
- **Roadway Lighting Criteria**
- **LED Lighting**
- **LED Cobra Head Light Fixtures Available in Today's Market**
- **Induction Lighting**
- **Financing**
- **Questions/ Answers**



INTRODUCTION

Lighting of outdoor areas including streets, roadways, parking lots, and pedestrian areas is currently dominated by metal halide (MH) and high-pressure sodium (HPS) sources. These relatively energy-efficient High Intensity Discharge (HID) light sources have been in use for many years and have well-understood performance characteristics. Recent advances in LED technology have resulted in a new option for outdoor area lighting, with several potential advantages over MH and HPS sources. There are also not as well known technologies such as Induction Lighting, that while has been around for over 12 years, and has demonstrated superior lighting performance, was not available to main stream and now the cost of this lighting is compatible with LED lighting.



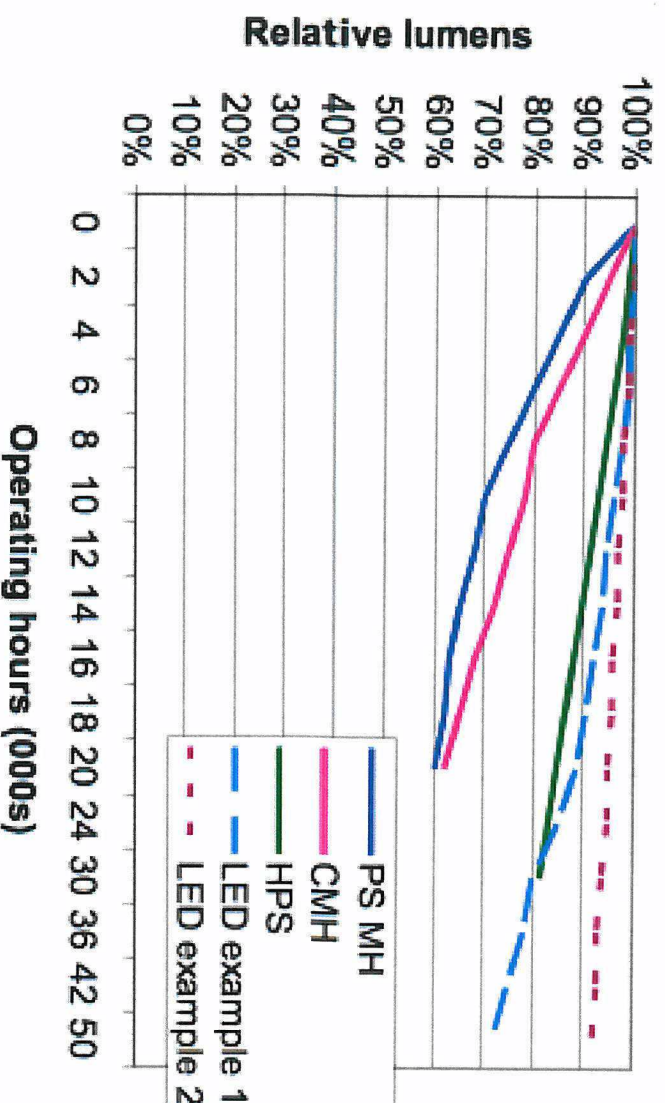
ROADWAY LIGHTING DESIGN

Glossary of Lighting Terms

- **Lumen (lm):** A unit of luminous flux; the overall light output of a luminous source is measured in lumens.
- **Foot candle (fc):** A unit of illuminance equal to 1 lumen per square foot.
- **Efficacy:** Efficiency of a light source expressed in lumens per watt (LPW or lm/W).
- **Light Loss Factor (LLF):** It takes into account temperature and voltage variations, dirt accumulation on Luminaire and room surfaces, lamp depreciation, maintenance procedures and atmosphere conditions.
- **Correlated color temperature (CCT):** The measure used to describe the relative color appearance of a white light source. CCT indicates whether a light source appears more yellow/gold/orange or more blue, in terms of the range of available shades of "white." CCT is given in Kelvin (unit of absolute temperature).
- **Color rendering index (CRI):** Indicates how well a light source renders colors of people and objects, compared to a reference source.

Glossary of Lighting Terms Continued

- **Illuminance:** Light arriving at a surface, expressed in lumens per unit area; 1 lumen per square foot equals 1 *foot-candle*, while 1 lumen per square meter equals 1 *lux*.
- **Scotopic:** Scotopic vision is the monochromatic vision of the eye in low light. Since cone cells are nonfunctional in low light, Scotopic vision is produced exclusively through rod cells so therefore there is no color perception. Scotopic vision occurs at luminance levels of 10⁻² to 10⁻⁶ cd/m².
- **Photopic:** Photopic vision is the vision of the eye under well-lit conditions. In humans and many animals, Photopic vision allows color perception, mediated by cone cells.
- **Initial & Mean Lumen:** Initial lumens are the initial light output. Mean lumens is the average lamp output over a designated amount of time.



Typical lumen maintenance curves for HID sources, and estimated curves for LED.

All light sources experience a decrease in light output (lumen depreciation) over their operating life. To account for this, lighting designers use mean lumens, usually defined as luminous flux at 40% of rated life, instead of initial lumens. For HPS lamps, mean lumens are about 90% of initial lumens. Pulse-start MH mean lumens are about 75% of initial lumens, while ceramic MH lamps have slightly higher mean lumens, around 80% of initial lumens. See Figure above for typical lumen maintenance curves for these HID light sources and two example curves for LEDs: one designed for 50,000-hour useful life (LED example 1) and one designed for longer life (LED example 2).

•A useful way to determine the quality of light source is its through its color rendering index (CRI)

•A low color temperature implies warmer (more yellow/ red) while high color temperature implies a colder (more blue) light

•Some typical color temperatures are:

1500k	Candlelight
2680k	40w incandescent lamp
3000k	200w incandescent lamp
3200k	sunrise/sunset
3400k	Tungsten lamp
3400k	1 Hour from dusk/ dawn
5000k-4500k	Xenon lamp
5500k	Sunny daylight around noon
5500k-5600k	Electronic photo flash
5600k-7500k	Overcast sky
9000k-12000k	Blue sky

Table 1. Examples of Outdoor Area Luminaire Photometric Values			
	150W HPS	175W MH	LED
Luminaire (system) watts	183W	208W	153W
CCT	2000 K	4000 K	6000 K
CRI	22	65	75
Rated lamps lumens, initial	16000	11700	n/a
Downward luminaire efficiency	70%	81%	n/a
Downward luminaire lumens, initial	11200	9477	10200
Luminaire efficacy	61 lm/W	46 lm/W	67 lm/W

Sources: HPS and MH: published luminaire photometric (.ies) files. LED: manufacturer data.

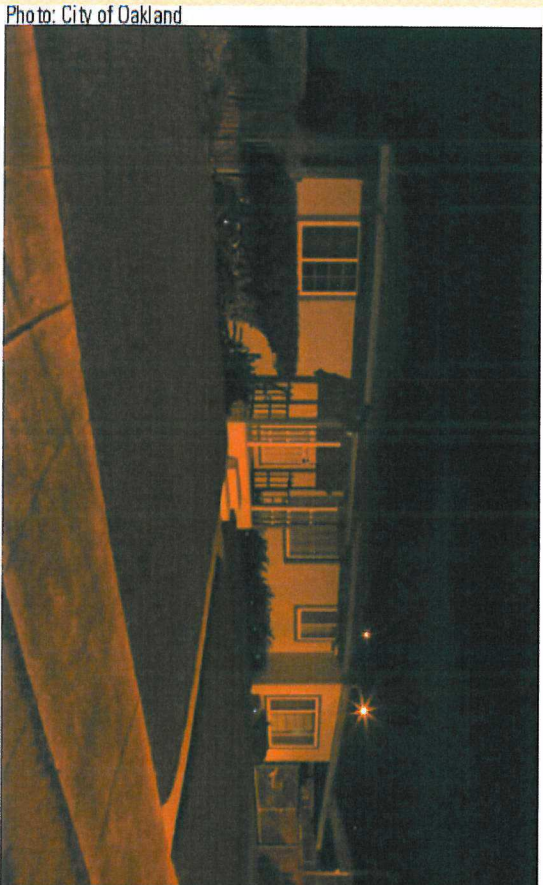
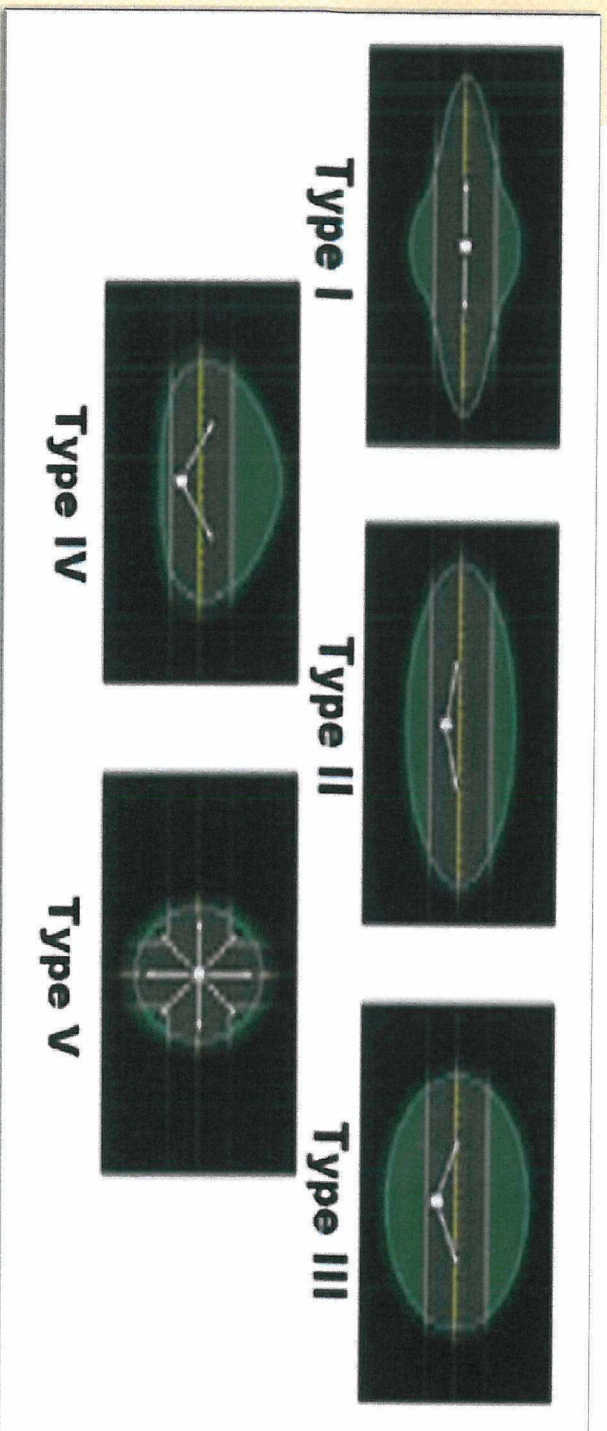


Photo: City of Oakland

Photo: Beta LED

Before and after photos highlight the visual contrast between HPS street lighting (left) and LED street lighting (right).

Luminaire Light Distribution Classification Overview



- The type I distribution is ideal for narrow walkways or bike paths.
- The type II distribution is ideal for wider walkways, entrance roadways, bike paths and other long and narrow lighting applications.
- The type III distribution is ideal for roadway, general parking, and other area lighting applications.
- The type IV distribution is especially suited for wall mounting applications and for illuminating the perimeter of parking areas.
- The type V distribution is ideal for general parking and area lighting applications.

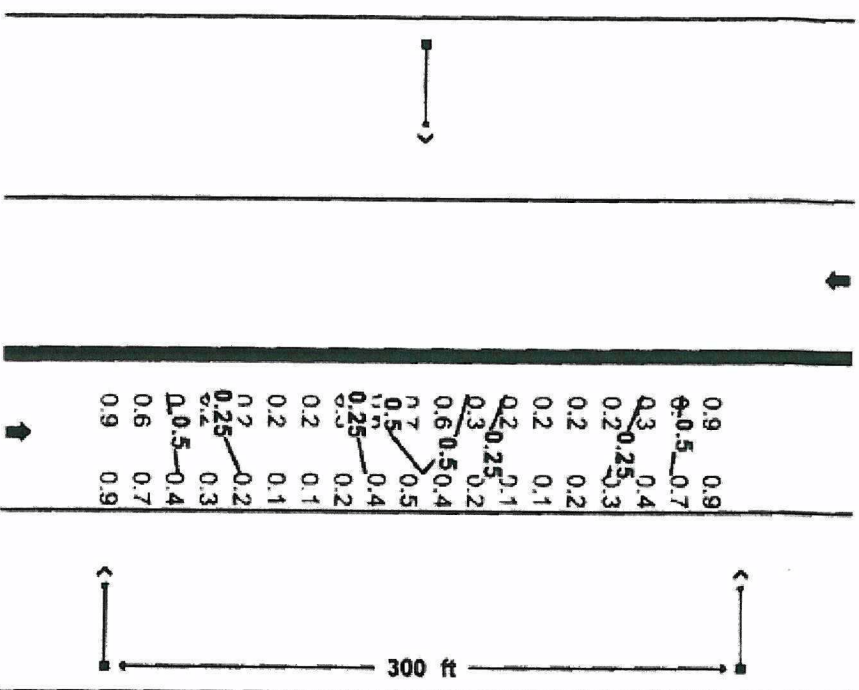
IES LIGHTING LEVEL RECOMMENDATION

Average Maintained Illuminance Values in Footcandles				
Road And Area Classification		Pavement Classification (R2 & R3)		Uniformity Ratio (Ave./Min.)
Freeway (A)			0.9	3 to 1
Freeway (B)			0.6	3 to 1
Expressway	Commercial		1.4	3 to 1
Expressway	intermediate		1.2	3 to 1
Expressway	Residential		0.9	3 to 1
Major	Commercial		1.7	3 to 1
Major	intermediate		1.3	3 to 1
Major	Residential		0.9	3 to 1
Collector	Commercial		1.2	4 to 1
Collector	intermediate		0.9	4 to 1
Collector	Residential		0.6	4 to 1
Local	Commercial		0.9	6 to 1
Local	intermediate		0.7	6 to 1
Local	Residential		0.4	6 to 1

Visual Roadway Lighting Tool - LED Cobra Head Lighting

10/1/2009

Illuminance



Grid Statistics

Average	0.4	fc
Max	0.9	fc
Min	0.1	fc
Max/Min	9.0	
Avg/Min	4.0	

Grid Properties

Number of Rows	19
Row Spacing	15.79 ft
Number of Columns	2
Column Spacing	6 ft

Incumbent Technology - HPS

100 Watt HPS



70 Watt HPS



Trial Technology - LED

60 LED Type 3
(350 mA)



30 LED Type 2
(525 mA)



Graphics above show a representation of the uniformity of the illumination provided by each of the technologies

LED LIGHTING

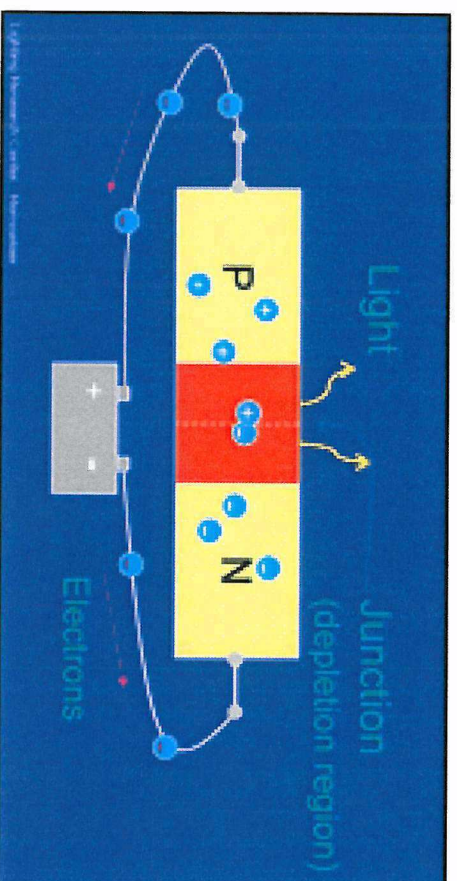
How LEDs Produces Light Vs. Other Conventional Lamps

➤ In an *incandescent lamp*, a tungsten filament is heated by electric current until it glows or emits light.

➤ In a *fluorescent lamp*, an electric arc excites mercury atoms, which emit ultraviolet (UV) radiation. After striking the phosphor coating on the inside of glass tubes, the UV radiation is converted and emitted as visible light.

➤ *Metal halide lamps* produce light by passing an electric arc through a mixture of gases

➤ An LED, in contrast, is a semiconductor diode. This means that the light in LED is emitted from solid object- a semi-conductor diode- rather than a filament in a case of incandescent lamp or expanded gas in HID lamps.



ANCHORAGE, ALASKA SWITCHES FROM HPS

- City of Anchorage hired Nancy Clanton, a nationally renown lighting designer
- Induction and LED street lights were evaluated
- Although some people did not like the intensity from the LEDs at certain angles, the Philips induction systems did not provide sufficient light at cold temperatures
 - Sylvania Icetron induction may work better in cold temperatures than the Philips QL induction, but Anchorage did not test Sylvania Icetron

ANCHORAGE, ALASKA SWITCHES FROM HPS

- Anchorage selected Beta Lighting's LED fixtures
 - 30 1W LEDs driven at 700ma replacing 100W HPS
 - 40 1W LEDs driven at 700ma replacing 150W HPS
 - 4000 fixtures purchased and installed in first of four phases
 - About 50% energy savings, plus longer life, etc.
 - Very quick installation time, excluding driving to each pole and raising lift

ANCHORAGE, ALASKA SWITCHES FROM HPS

- Beta's HID cobra head replacement fixture
 - Ledway



PITTSBURGH AND SAN JOSE LOOKING AT LEDs FOR STREET LIGHTING

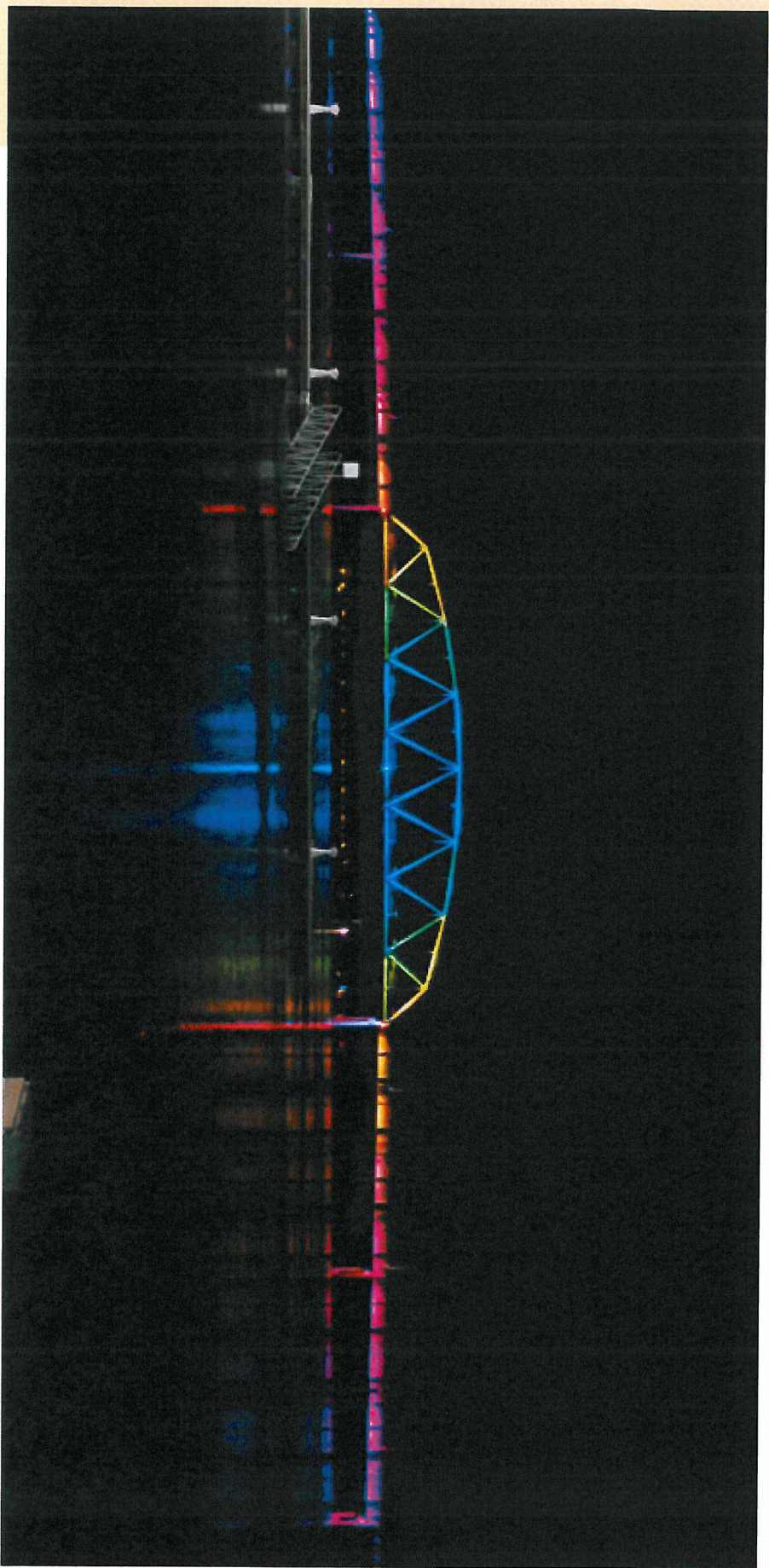
- From LEDs Magazine Newsletter 2/9/2009
- Two major cities in the USA are considering plans to start converting street lights to LEDs.
- Pittsburgh is considering the replacement of its 40,000 street lights with LED fixtures, according to a news report in the Pittsburgh Post-Gazette.
- The city estimates it could save up to upwards of \$1.4 million a year in energy and maintenance costs, and “look nicer.”
- Next month the city expects to invite firms to submit ideas for a pilot transformation of some portion of the city’s street light system to one of several available technologies, including LED, although other efficient technologies have not been ruled out.
- Public Works Director Guy Costa said the city spends around \$4 million a year powering and maintaining its lights, and figured the city could shave \$1.4 million from that total.
- Council officials debated how to select a vendor for the work, which could involve a \$25 million contract, through a competitive bidding process.

PITTSBURGH AND SAN JOSE LOOKING AT LEDs FOR STREET LIGHTING

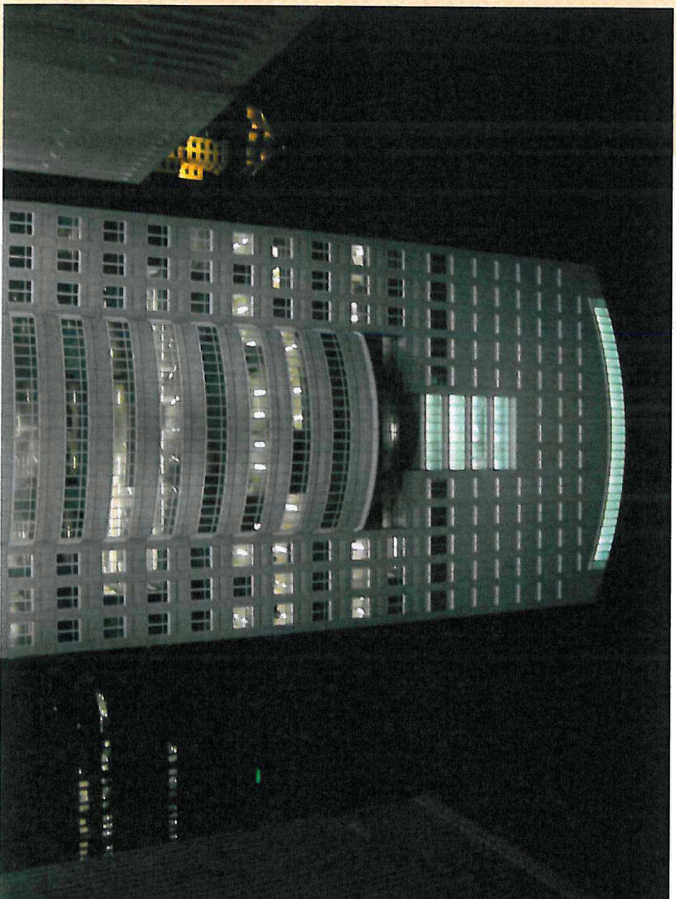
- Meanwhile in California, San Jose is looking to replace its 62,000 streetlights with new LED versions that will “cast a white, warm glow, could cut energy costs in half, and will use state-of-the-art technology to vary their intensity and timing,” according to the Mercury News.
- For decades, says the article, San Jose motorists, pedestrians and police have complained about the city's thousands of yellow streetlights, which are too easily confused with traffic signals, and distort the colors of cars and painted curbs.
- San Jose plans to convert 100 lights this spring, and is seeking \$20 million from a government stimulus package to install 20,000 new lights as part of a project that officials think will attract national attention. The goal is to have all the city's streetlights changed by 2022.

FOR WHITE LIGHT AREA LIGHTING, THERE IS MORE THAN POLE FIXTURES

- Following slide will show examples of several exterior LED fixtures



WALL WASHINGTON IOWA OFFICE BUILDING



WHITE LEDs AT WHITE HOUSE



LED LIFE

- Since high lumen white LEDs are a relatively new technology and keep improving
 - Please be very aware that rated lives are projections, and even the best projections are still projections
 - For example 100,000 hour rated LED
 - Never turned off, would take 11.4 years to lose projected 30% of initial lumens
 - A lot of different stuff can happen to an LED chip in 11 years
 - On 4000 hours per year would take 25 years to lose projected 30% of initial lumens
 - A lot more can happen in 25 years
- Even if the LEDs last 100,000 hours, will cherry picker trucks or lifts be required to clean fixtures much more frequently?

Light Loss Factors – LEDway Street Lighting Luminaire

night time ambient °C	drive current	50K hr LLF	100K hr LLF
5	350	0.98	0.92
	525	0.89	0.76
	700	0.77	0.57
10	350	0.95	0.88
	525	0.86	0.71
	700	0.74	0.52
15	350	0.93	0.83
	525	0.82	0.65
	700	0.70	0.48
20	350	0.90	0.78
	525	0.78	0.60
	700	0.66	0.43
25	350	0.86	0.73
	525	0.74	0.54
	700	0.63	0.39

LIFE REALITY CHECK

- Even based on 50,000 hour projected life, that is 12.5 years based on dusk to dawn operation
- Just think what can fail in 12.5 years with hot sun, cold, rain, etc.
 - Solder joints
 - Wires
 - Capacitors and/or other components in drivers
 - LEDs (which may be most resilient)
- Expand this to 100,000 hour projected life, which would be 25 years
- This issue also applies to other long life technologies, such as induction, which will be discussed later



WARRANTY

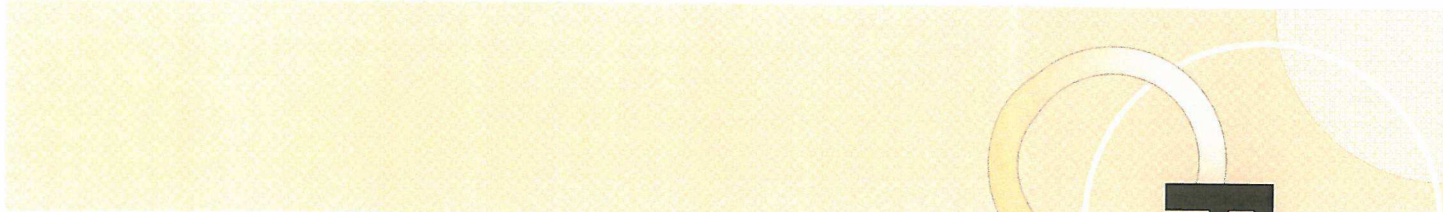
- You should not have to settle for less than a 5 years
- Maybe you could negotiate longer warranties

GLARE CONCERN

- At certain angles some LED fixtures can be considered glary
 - Like looking into several high wattage MR16 narrow spots
 - Usually not a deal killer, but be aware

MODULAR DESIGN

- Some LED fixtures are modular so parts are easily replaceable for maintenance and upgrades
 - LED panels
 - Driver(s)
- LEDs are improving lumen watts about 25% per year
- For example
 - If fixtures with 4 LED panels are purchased now, maybe in 3 - 5 years, each fixture could be retrofitted with 3 LED panels, providing the same amount of light, but saving almost 25% wattage
- On the other side, if an LED fixture lasts for 50,000, which for dusk to dawn, that will be about 12 years, and new high performance fixtures then may be much smaller and different design



RECYCLING

- There is a lot of valuable metal, used as heat sinks, etc. in LED fixtures
- This should be recycled
- Several manufacturers have programs to pay for their old LED fixture returned and offer a discount on new LED fixtures for down the road

SHOULD BUY LED FIXTURES NOW OR WAIT?

- LED fixtures in a few years may cost half as much and be twice as bright than existing
 - Currently some LED cobra head fixtures cost about \$500
 - In 5 years, they may cost \$100 - \$150, which would make HID and other incumbent technologies obsolete
- But if you wait a few years, you would not get the benefit of LED fixtures until then

LED DEVICE PERFORMANCE PROJECTIONS

Metric	2007	2010	2012	2015
Efficacy-Lab (lm/W)	120	160	176	200
Efficacy- Commercial Cool White (lm/W)	84	147	164	188
Efficacy- Commercial Warm White (lm/W)	59	122	139	163
OEM Lamp Price- Product (\$/klm)	25	10	5	2

US DOE SSL R&D MYPP, March 2008, table 4-2.

LED LUMINAIRE PERFORMANCE PROJECTIONS

Metric	2007	2010	2012	2015
Device Efficacy- Commercial Cool White (lm/W, 25 degrees C)	84	147	164	188
Efficacy-Commercial Warm White (lm/W)	59	122	139	163
Thermal Efficiency	85%	89%	91%	95%
Efficiency of Driver	85%	89%	91%	95%
Efficiency of Fixture	77%	84%	88%	95%
Resultant luminaire efficiency	56%	66%	73%	86%
Luminaire Efficacy- Commercial Cool White (lm/W)	47	97	121	161
Luminaire Efficacy- Commercial Warm White (lm/W)	33	80	101	140

DON'T BUY AN LED FIXTURE UNLESS

- You can get results from independent test lab, certified by the DOE
 - LM79
 - Lumens, lumens per watt ratings out of the fixture at steady state, etc.
 - LM80
 - Rated life at expected temperatures inside fixtures
 - Thermal data from chip manufacturers is supplied to fixture manufacturers, which incorporate that info with their fixture thermals
 - And these results need to be good
- Also good to be Energy Star rated
- Manufacturer has deep enough pockets and has a long enough proven track record

LOOK FOR THESE APPLICATIONS FOR LEDS

- Where full cut-off for dark sky and maybe other concerns is important
- Where getting sufficient light in far corners necessary area without excessive light underneath fixture

LOOK FOR THESE APPLICATIONS FOR LEDS

- 24 hour applications, like garages, because most potential savings
- Garages and parking lots where can use
 - occupancy sensors for high/low or on/off lighting
 - Neither of these shorten LED life, like they can for other lighting technologies
- No long warm up and restrike times like HID

DOE MUNICIPAL SOLID-STATE STREET LIGHTING CONSORTIUM

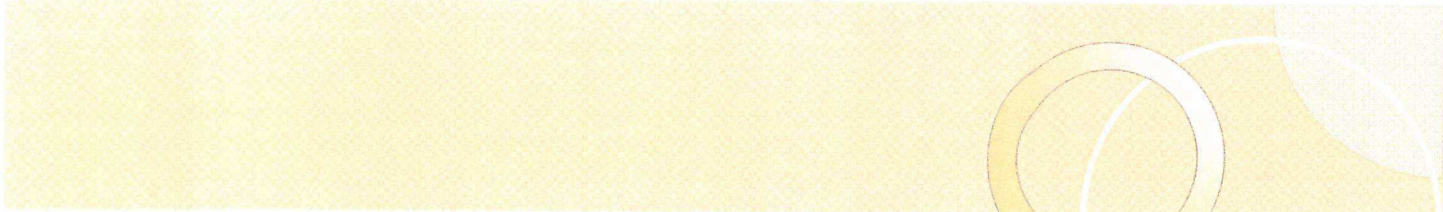
- To leverage the efforts of multiple cities pursuing evaluations of LED street lighting products, DOE has announced the formation of a Municipal Solid-State Street Lighting Consortium. The Consortium will collect, analyze, and share technical information and experiences related to LED street lighting demonstrations.
- Membership will be open to municipalities, utilities, and energy efficiency organizations (more details will follow soon). DOE does not anticipate that Consortium membership will be open to manufacturers, though manufacturers might occasionally be invited to present information on selected topics at Consortium meetings. DOE expects to launch the Consortium in September 2009.
- www1.eere.energy.gov/buildings/ssl/gatewaydemos_consortium.html

CONTROL SYSTEMS

- There is an evolution of wireless and power line carrier wave control systems, which can
 - For all technologies signal the facility's office about
 - Light sources not working
 - Including HPS lamp cycling
 - Lights on during day due to faulty photocell
- Especially for LEDs, can include
 - Continuous or staged dimming
 - When junction temperature too high
 - When traffic is greatly reduced during the night, so need less light
 - Could also work for dimming induction generators and dimming MH ballasts/amplifiers

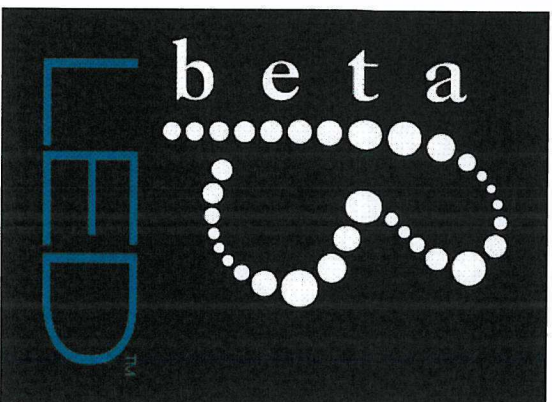
MADE IN USA?

- With this serious recession, keeping American jobs is important, not just for LED fixtures, but also with other fixtures
- Beta Lighting LED fixtures is just one example
 - Cree LED crystals made in USA
 - LED assembly done in Taiwan
 - Philips/Advance drivers made in Mexico
 - Fixtures made in Wisconsin, USA

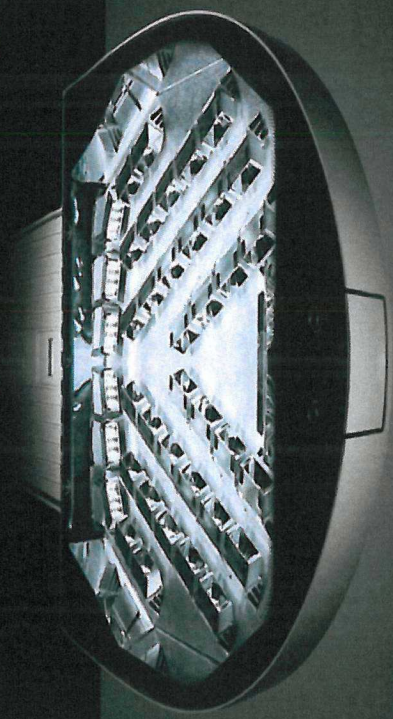


Reputable LED Cobra Head Fixtures in Today's Market

Beta's LEDway Products

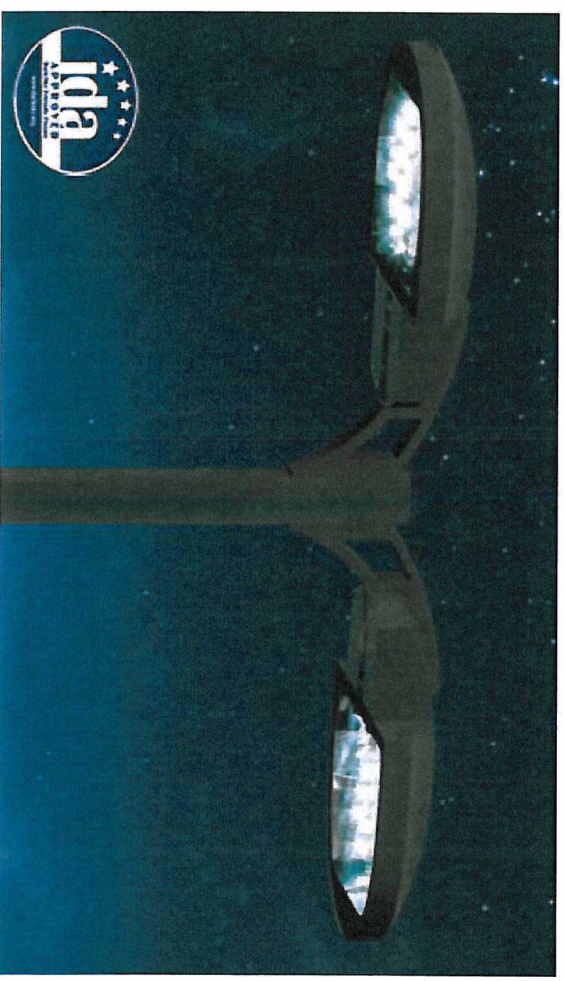


WARP9® LED



The Planet's Commitment to LED, Safe and Street Lighting

KIM LIGHTING

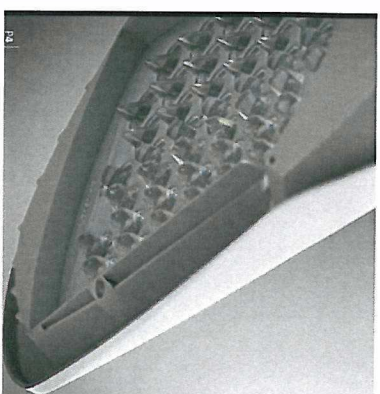


KIM LIGHTING

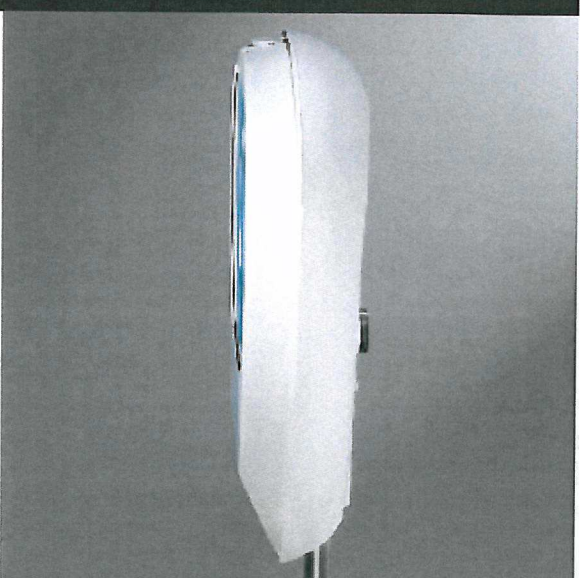


ROADSTAR™ SERIES

PHILIPS
LUMEC



COOPER LIGHTING - LUMARK®



RC LED
ROADWAY SMALL
CUTOFF
COBRAHEAD

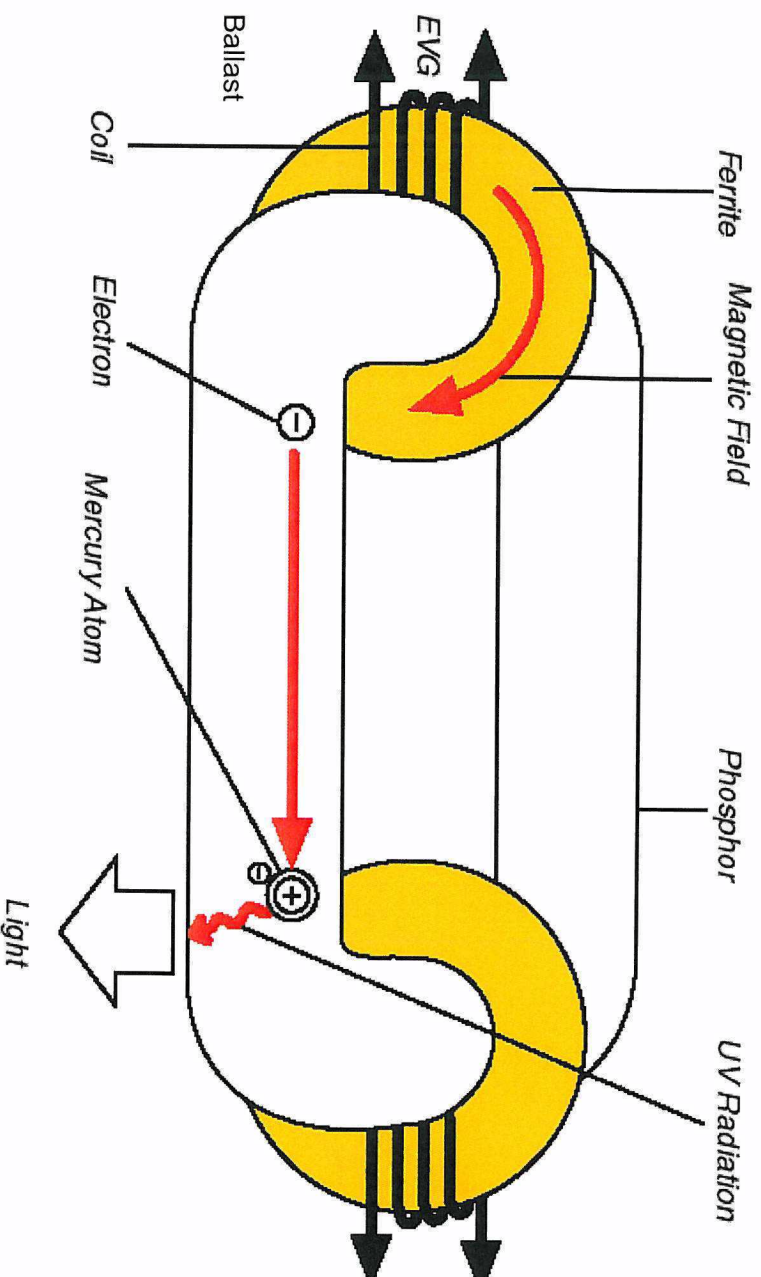


INDUCTION LIGHTING

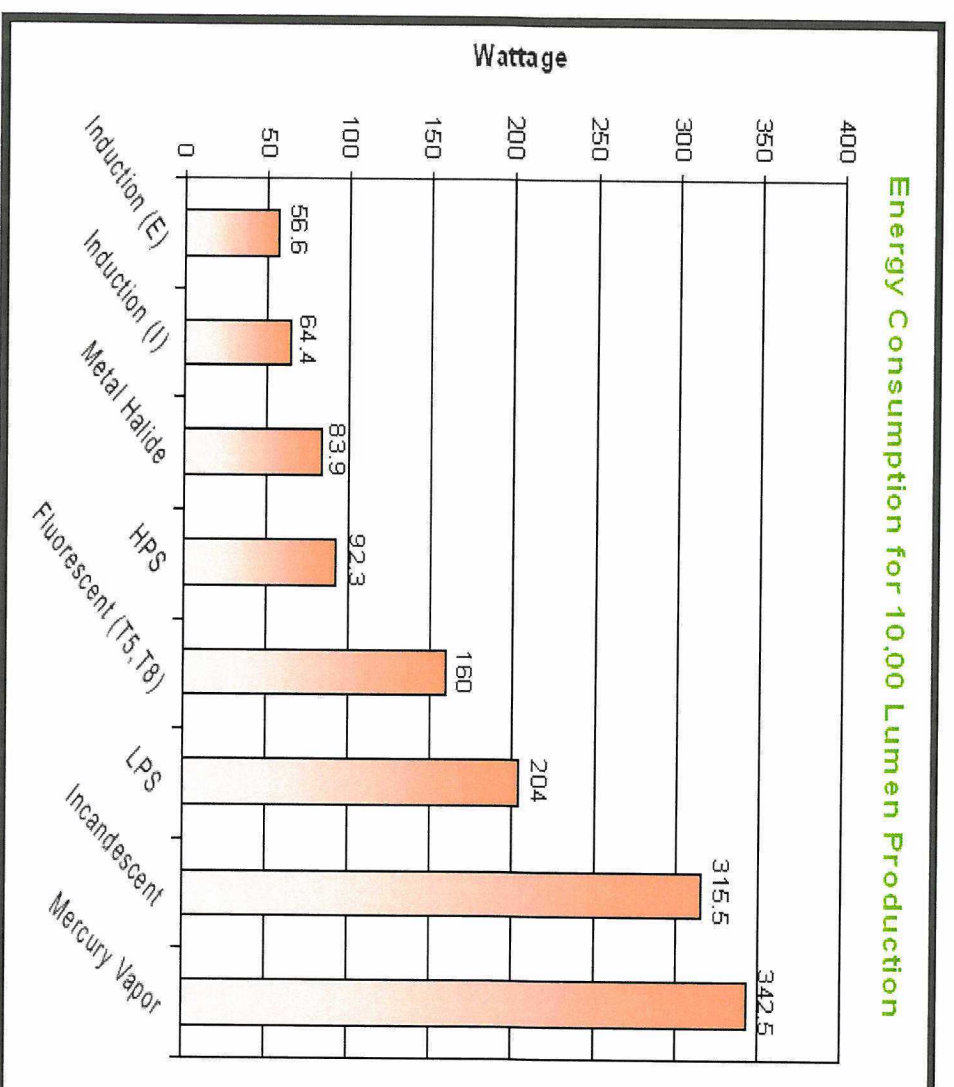
WHY INDUCTION LIGHTING?

- Typically, fluorescent and HID lamps have one common weakness - The lamp cathode or electrode filament
- 12 years ago, lamp manufacturers introduced a fluorescent lamp which does not require electrodes. These lamps will last up to 100,000 hours equating to 20 years for most users

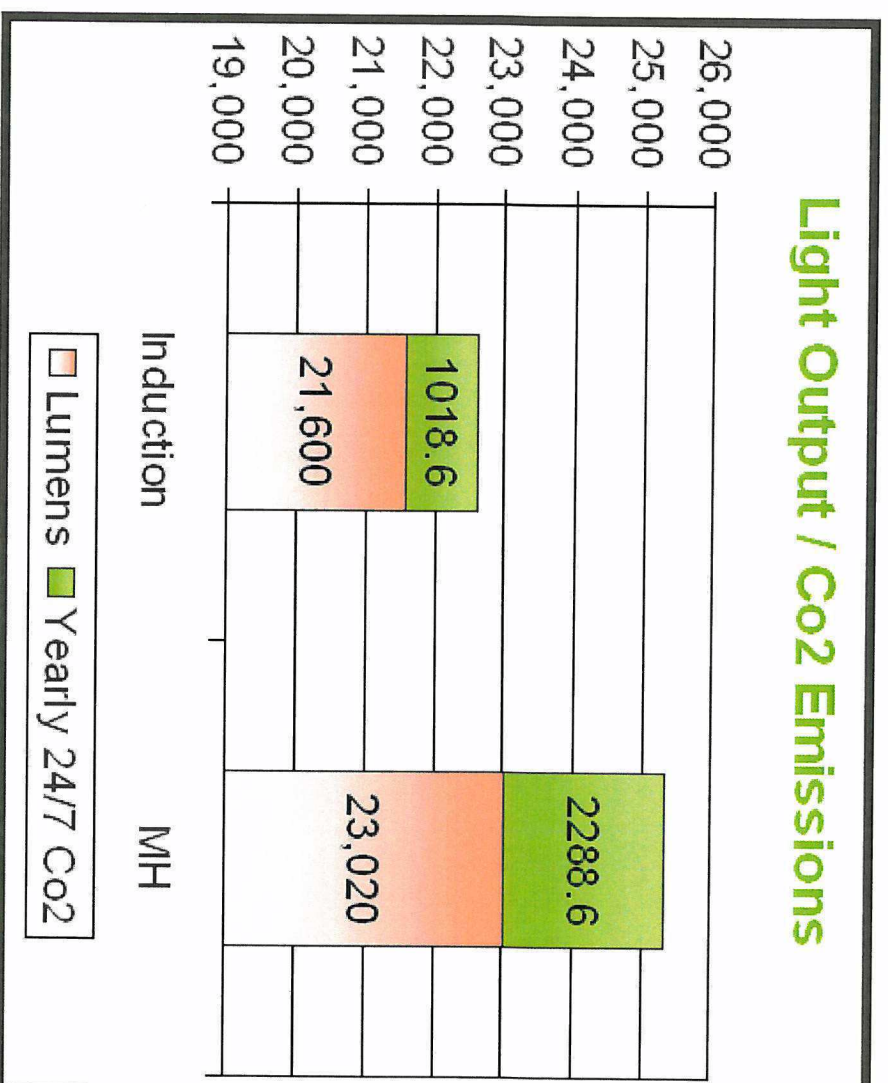
ICETRON OPERATING PRINCIPLE



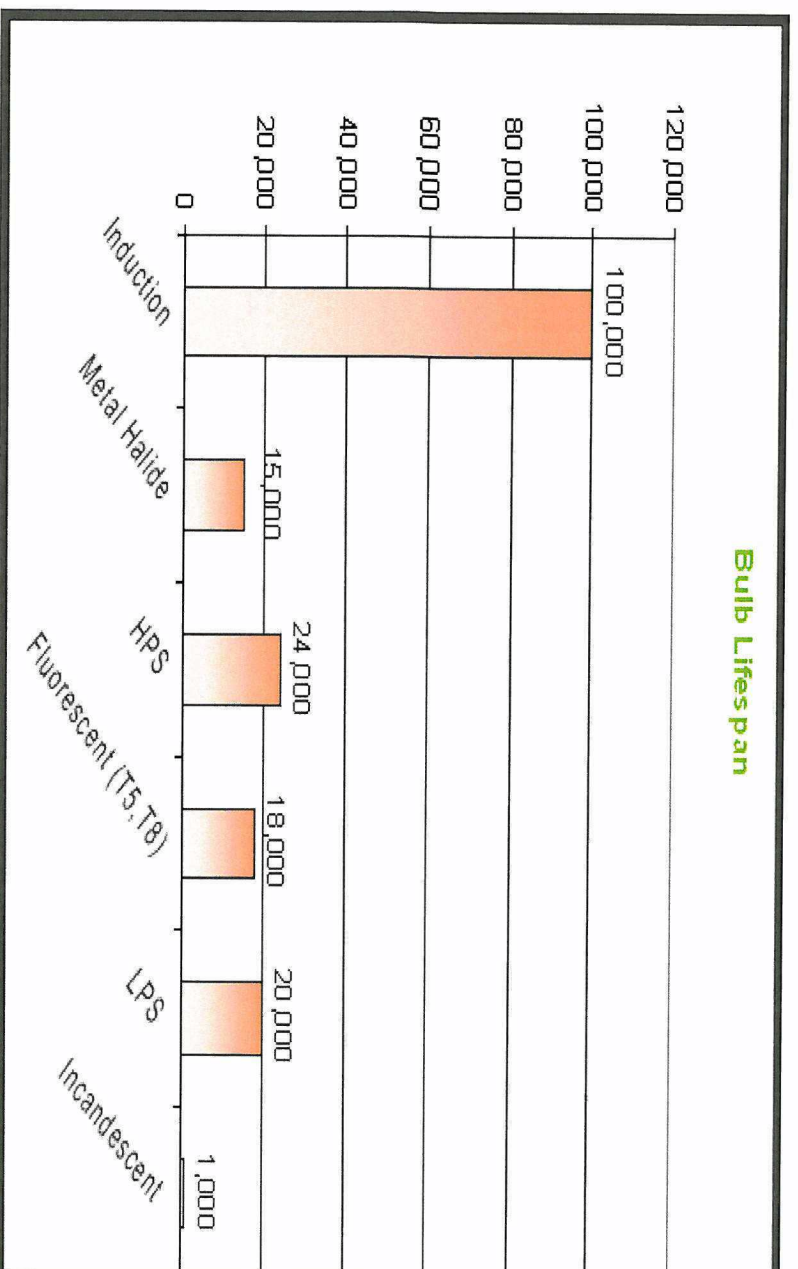
The system consists of an inductively coupled fluorescent lamp and a high frequency electronic ballast. The system uses magnetic-induction technology instead of an electrode at each end of the fluorescent tube to power the discharge. Removal of the electrodes eliminates one of the major life-limiting components of a fluorescent lamp.



Less Wattage = Less CO₂ Emissions: about 70% of the US electricity production comes from burning fossil fuels, (coal and gas) due to the lower wattage required to operate an induction lamp and its long lifespan, Induction bulbs emit less than half CO₂ than Metal Halide systems.



- Extremely low heat emission = 1/3 reduction on AC usage consumption on indoor applications: an incandescent bulb uses only 10% of its energy to produce light, the remaining 90% its wasted as heat. An Induction bulb only wastes about 1% of its energy output in heat, the rest is used for light production, the reduction in heat emission means a reduction in A/C usage for indoor applications.
- Longer Lifespan = less landfill space: an Induction bulb lasts 100,000 hrs, compare that to a Metal Halide bulb which only lasts 15,000. By the time you have to replace the induction bulb for the first time you would have already dumped 6 Metal Halide ones.



- Mercury Containment: energy efficient lighting uses mercury, some in liquid form and some in solid form. Induction Bulbs use Mercury in solid form thus allowing for it to be easily removed for recycling or, in case of accidental breakage, to be easily picked up (wearing safety disposable gloves) and properly disposed of. Liquid Mercury can be absorbed into flooring creating a contaminated area once it evaporates.
- Closed Loop Recycling Program: Make sure to retrieve your old system and dispose of it properly to achieve maximum sustainability recycling any possible part.

Why The push to Eliminate Standard H.I.D Traditional Fixtures There are Better Choices

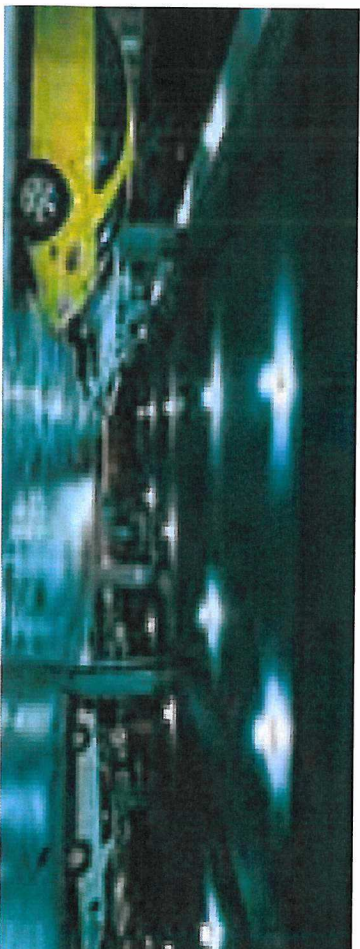
- = Wattage Savings Over 55%
- = Better color
- = Better Performance
- = introduction of Electronics
- = 0-Restrike Time

ICETRON® QUICKTRONIC® SYSTEMS



- 100,000 HOUR SYSTEM LIFE
- WHITE LIGHT
 - 3500K & 4100K
 - 80CRI
 - **New 5000K**
- Amalgam technology
- Lamp to Lamp color consistency
- 70% lumen maintenance at 60,000 hours
- Quick 60+ system warranty
- Covers Lamp & Ballast

Parking Garage



Replace HPS
and Cut

Wattage in half,
While outlasting
4-5 times

Longer



Replace low wattage Metal Halide savings 25-50% and reduce Maintenance by 10
Lamp changes



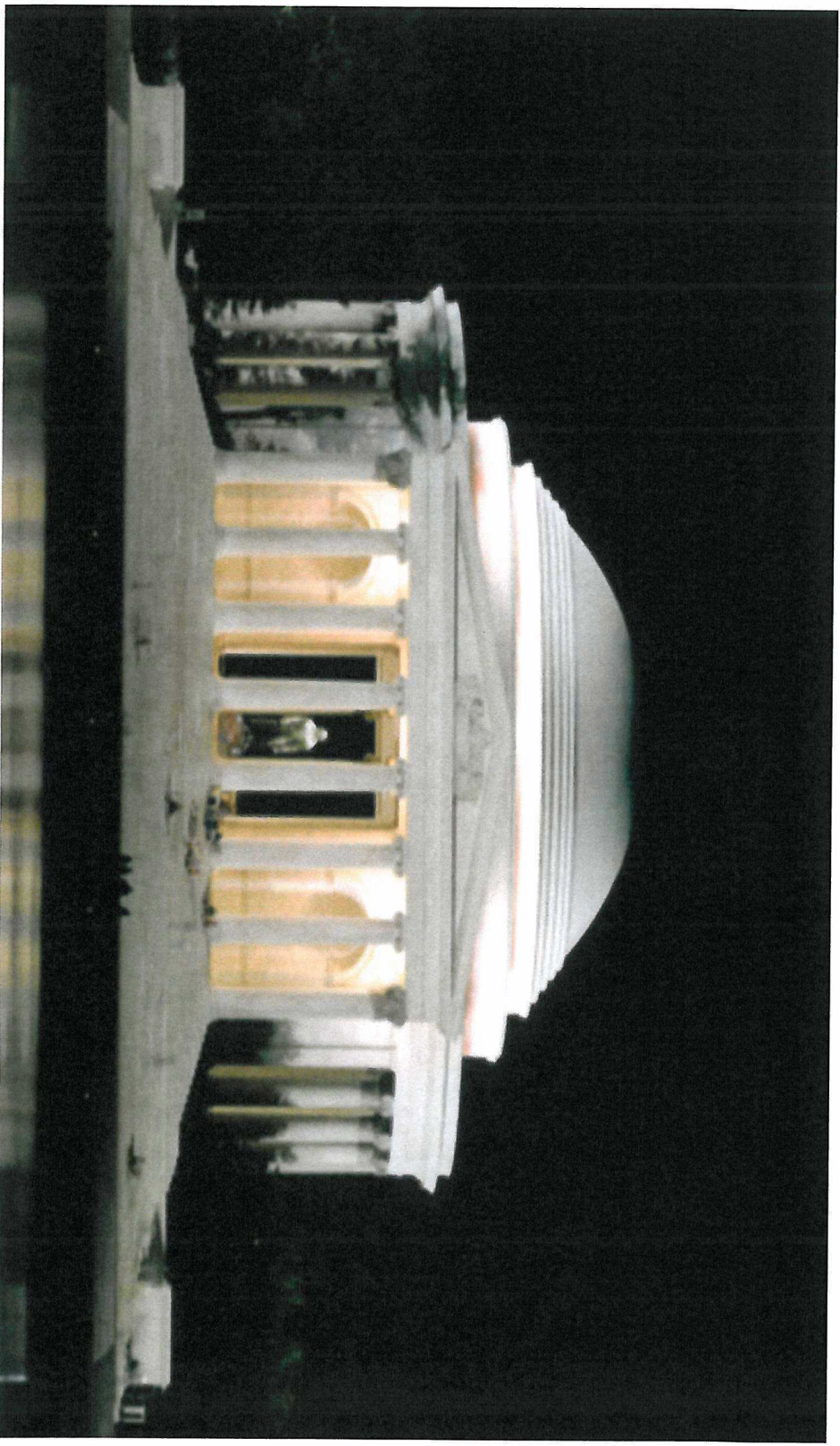
ICETRON® QUICKTRONIC® SYSTEMS



- CONOPY, wall or pole - mount.
- Sylvania ICETRON lamp and ballast system
- Rated @100,000 hours – 5 years warranty.

ICETRON® QUICKTRONIC® SYSTEMS

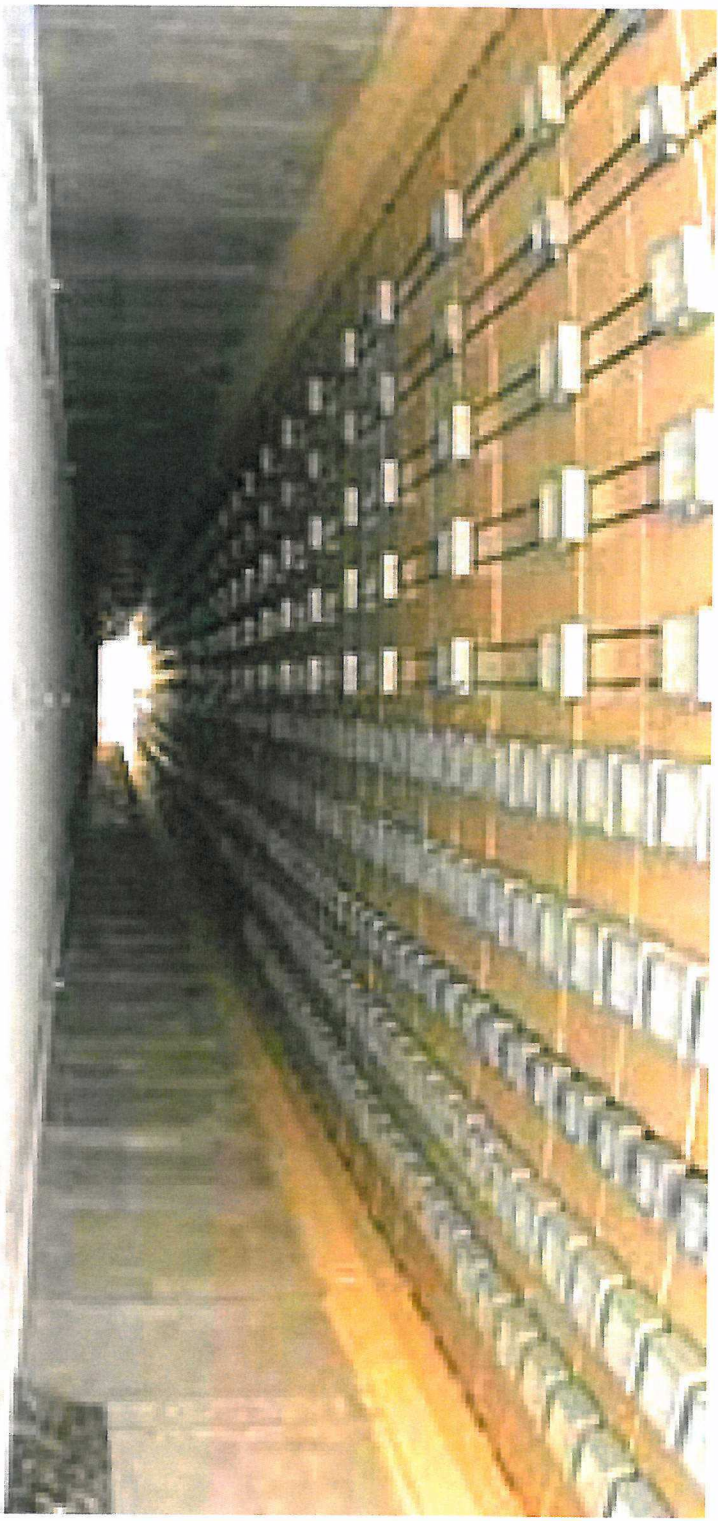
Jefferson Memorial Washington, DC



Application: General

Illumination Inside the dome

ICETRON® QUICKTRONIC® SYSTEMS



SPRING Valley Tunnel, Texas DOT, Richardson, Texas

75% ICETRON QUICKTRONIC Systems



INDUCTION LIGHTING

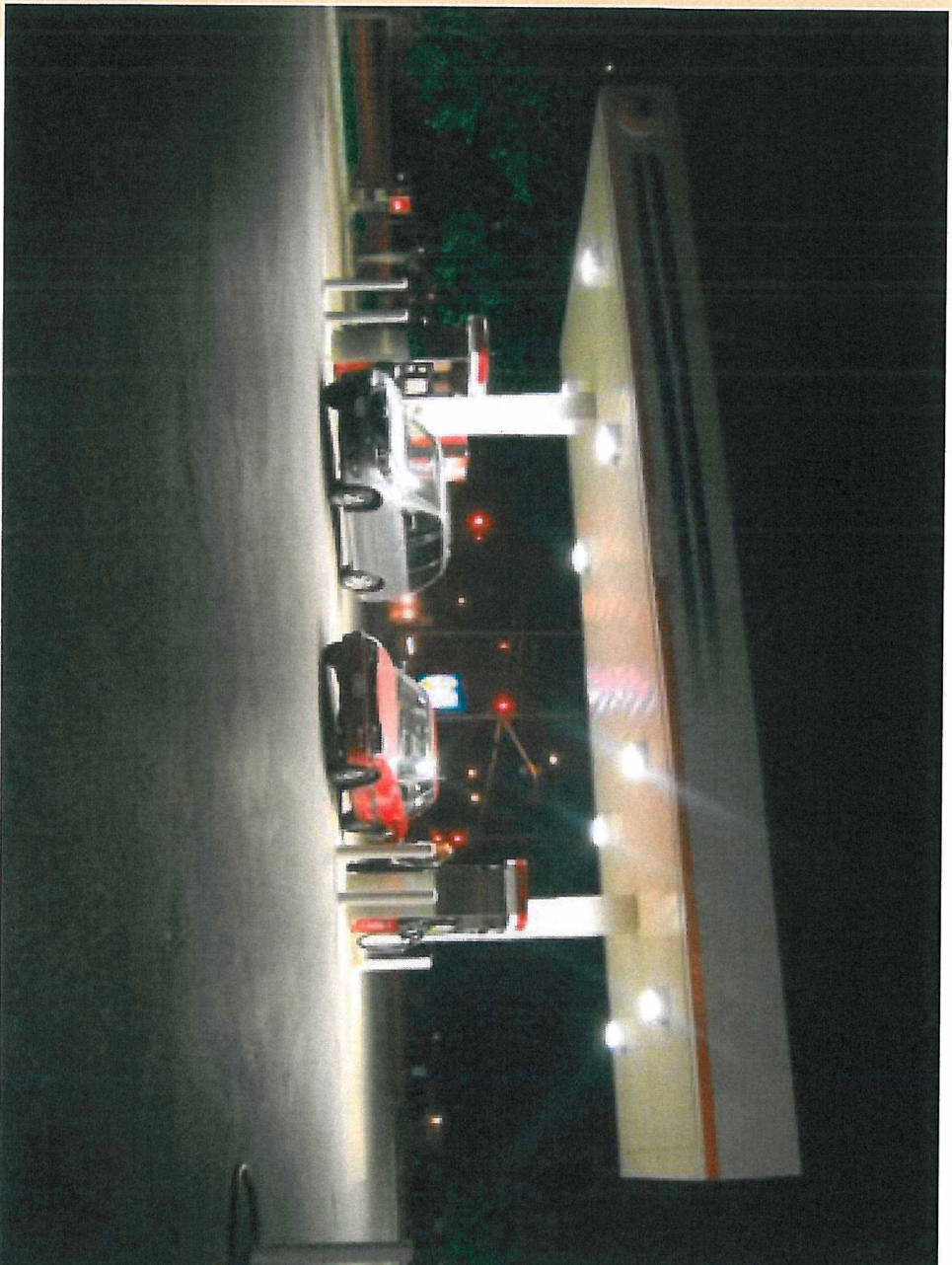
- **Extremely long life compared to HID lamps**
- **Dramatic savings on maintenance costs**
- **33-67% energy savings over HID equivalents**
- **High sustainability-100,000 hour rated life**

INDUCTION LIGHTING



- High color rendering requires less input wattage
- White fluorescent light provides better visibility
- Instant on - Immediate re-strike - no warm up required
- Operates efficiently down to -40°F
- Vibration resistant / Low heat transmission
- Remote Ballast Option for Easy Maintenance

INDUCTION LIGHTING



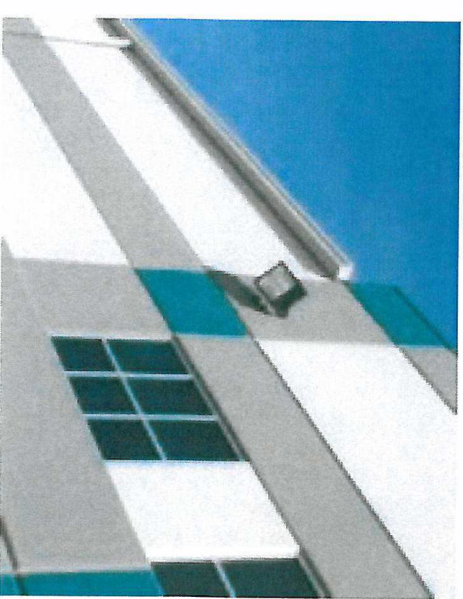
- **Will endure virtually unlimited number of starts**
- **Long life equates to lowest amount of mercury released into environment**
- **Proven technology - Has consistently fulfilled rating requirements**

INDUCTION LIGHTING

Ideal for Difficult to Access Installations

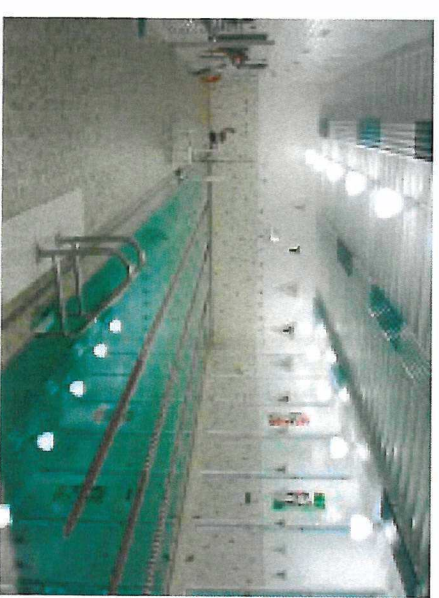
Outdoor

- Roadways, tunnels, bridges, signage
- Building security, parking lots, garages
- Parks, public spaces, gas stations



Indoor

- Warehouses, industrial buildings, manufacturing
- Clean rooms, gymnasiums, swimming pools
- Grocery & retail, cold storage, cafeterias



INDUCTION

- Name brands compared to Chinese manufacturers
 - With Philips and Sylvania you know that you will be able to get warranty support, replacement parts, etc
- Lamps and generators are not inexpensive
- Lumens per watt not nearly as good as high performance T8s, electronically ballasted CMH and some other systems



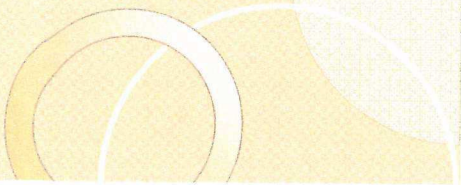
COMPARISON TABLES

LED VS. INDUCTION LIGHTING

- Some customers want to go with LEDs, because
 - Wow factor of LEDs
 - These customers are early adopters
- Some customers want incumbent technologies that have a proven track record
- Some customers want to wait a year or two for LED fixtures and testing to get better and less expensive

STREET POLE

\$0.120	KWH rate	\$0.05	/KWH 1st year saved rebate	15	years of long term benefit										
existing			proposed												
fixture & application type	fixture watts	annual hours	annual electrical cost	option letter	retrofit/replacement option description	fixture watts	watts reduced	annual electrical savings	appr. payback including maintenance	appr. installed cost	rated lamp life @ 12 hour cycles	payback including maintenance savings	long term benefit just electricity	long term benefit including maintenance	
100W HPS cobra head pole fixture with 24,000 - 30,000 hour rated lamp and magnetic ballast	138	4200	\$70	A	85W 5000K induction lamp, socket and electronic generator	85	53	\$27	\$11	\$400	100,000	14.6	7.3	\$12	\$412
				B	new high performance fixture with 70W 5000K induction lamp and electronic generator	77	61	\$31	\$13	\$600	100,000	19.1	9.5	-\$126	\$335
				C	new LED fixture with good distribution, 30 1W LEDs driven at 525mA	60	78	\$39	\$16	\$800	100,000 (maybe less for driver)	19.9	10.0	-\$194	\$396
				D	new high performance fixture with 70W dual arc tube HPS lamp	95	43	\$22	\$9	\$300	40,000	13.4	6.7	\$34	\$327
Spectrally or scotically enhanced lighting may not be applicable for this type of lighting.															



FINANCING



OPTIONS

- Continue to lease street lights from FPL
- Consider a Town-owned street light system



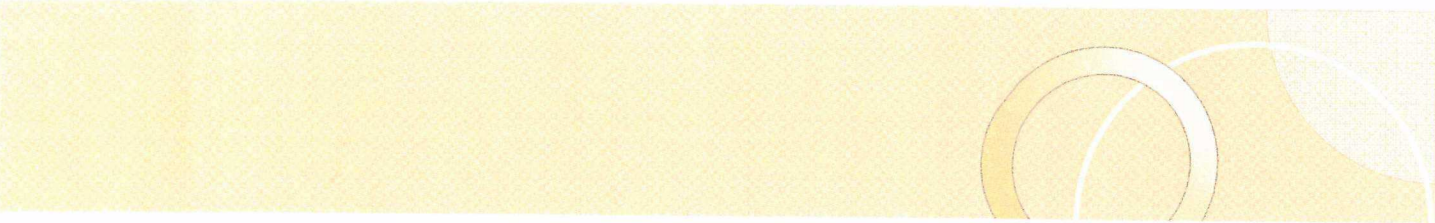
Continue to lease from FPL

- Funding through the Operating Budget
 - Small sections of Town could be lit annually as funding allows
 - Limited choices (eg. wood poles, HPS fixtures, overhead wiring)
 - Annual lease cost (approx. \$20.00/month/pole)
 - Estimate total lease cost - additional \$90,000/year
 - No new debt
 - Will take years to completely light the Town



Town-owned system

- Referendum for voter approved financing
- Put the question on the ballot in March OR
- Non-ad valorem special assessment on the tax bill
 - Light the entire Town within next two years
 - Choices (eg. fixtures, concrete poles, underground street light wires)
 - Increased safety
 - Increased property values
 - Energy efficient
 - Better quality lighting
 - Would allow increased tree canopy



Town-owned system – cont.

- Would incur new debt
- Eventually will incur some maintenance costs
- Decreased lease costs from FPL offset by increase in energy costs (only pay for what we use)
- After 20 years the Town owns the system



Cost Estimates

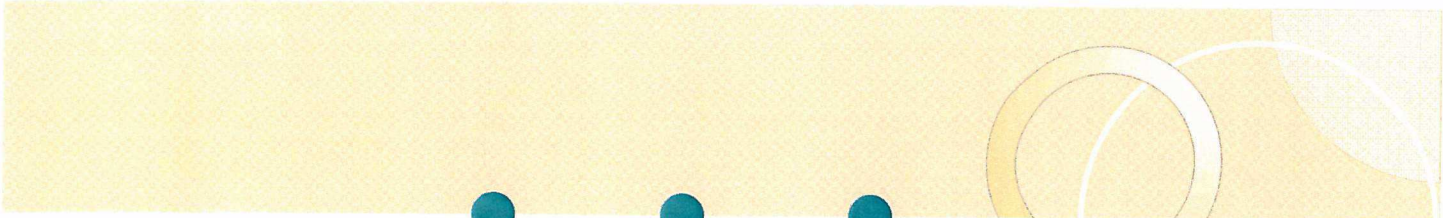
- Street Lighting with Overhead Wiring
 - Estimated Cost \$1,800,000
 - Annual Debt Service \$ 140,000
 - Debt Millage .29
- Street Lighting with Underground Wiring
 - Estimated Cost \$2,200,000
 - Annual Debt Service \$ 170,000
 - Debt Millage .35

Cost per Household Annually

Taxable Value	Overhead	Underground
100K	\$29.00	\$35.00
150K	\$43.50	\$52.50
200K	\$58.00	\$70.00
250K	\$72.50	\$87.50
300K	\$87.00	\$105.00

Current Debt Payment per Household

Taxable Value	Current Debt Cost
100K	\$140.00
150K	\$210.00
200K	\$280.00
250K	\$350.00
300K	\$420.00



WRAP UP

- Questions
- Comments
- Applications